



Digital archive for strong ground motions recorded in earthquake sequences

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Numerous structures and infrastructures systems have been recorded to encounter extensive damages or total collapse due to successive earthquake ground motions occurred in short time spans. A list of recent earthquake sequences, found to be detrimental for both humans and the building stock, comprises of seismic events from Amatrice-Italy (2016) and Kumamoto-Japan (2016), Gorkha-Nepal (2015) and Tōhoku-Japan (2011). Nevertheless, the current seismic codes prescribe the structural design on the basis of a single “design” earthquake waiving the sequential seismic events that may increase the seismic vulnerability of structures. It is, thus, important to focus on this hazardous phenomenon in order, eventually, to mitigate its consequences. Over the last 15 years, the effects of earthquake sequences on the structural performance have been elucidated [1-3]. However, the use of real strong motions from successive ground shakings is commonly restricted to a single earthquake sequence event that may dominate (or bias) the structural response results [4]. Additionally, the artificially-developed earthquake sequences may derive questionable seismic demand [5]. Hence, this study is dedicated to compile a dataset including almost 7000 suitably selected strong ground motions, which were recorded worldwide during earthquake sequences and found of interest for studies addressing the structural response imposed by multiple earthquakes. The dataset compiled provides metadata related to seismological characteristics and strong ground motion parameters while, when necessary, the records were processed (i.e., base-line correction and frequency-based filtering). Finally, systematic analysis of the selected motions revealed trends on the basis of the several parameters associated with the successive earthquakes.

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